

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2006/0098148 A1

Kobayashi et al. (43) **Pub. Date:**

Publication Classification

May 11, 2006

Inventors: Setsuo Kobayashi, Mobara (JP); Kazuhiko Yanagawa, Mobara (JP)

(54) LIQUID CRYSTAL DISPLAY DEVICE

Correspondence Address: ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET **SUITE 1800** ARLINGTON, VA 22209-3873 (US)

(21) Appl. No.: 11/318,579

(22) Filed: Dec. 28, 2005

Related U.S. Application Data

(62) Division of application No. 10/438,101, filed on May 15, 2003.

(30)Foreign Application Priority Data

May 15, 2002 (JP) 2002-139684 (51) Int. Cl. G02F 1/1337 (2006.01)

(57)ABSTRACT

A liquid crystal display device includes a first substrate and a second substrate which are arranged to face each other in an opposed manner by way of a liquid crystal, first electrodes which are formed in a pixel region of a liquid-crystalside surface of a liquid crystal display part of the first substrate, and second electrodes which are formed in a pixel region of a liquid-crystal-side surface of a liquid crystal display part of the second substrate. The liquid crystal display device further includes an arrangement which, with respect to a voltage applied between the first electrodes and the second electrodes formed per one or a plurality of frames, sequentially applies the voltage which is equal to or less than 20% of the maximum voltage between the first and second electrodes of respective pixel regions.

